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Attachment and Field Dependence: Individual Differences in Information Processing

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The present research analyzes the relationship between attachment styles at an adult age and field dependence in order to identify possible individual differences in information processing. The "Experience in Close Relationships" test of Brennan et al. was administered to a sample of 380 individuals (160 males, 220 females), while a subsample of 122 subjects was given the Embedded Figure Test to measure field dependence. Confirming the starting hypothesis, the results have shown that individuals with different attachment styles have a different way of perceiving the figure against the background. Ambivalent and avoidant individuals lie at the two extremes of the same dimension while secure individuals occupy the central part. Significant differences also emerged between males and females.

Keywords: Attachment, field dependence

Introduction

Attachment and the Development of the Internal Working Model

The Attachment Theory developed by John Bowlby (1951, 1988) provides a theoretical reference framework for understanding human behavior which is based on the bond between the child and the caregiver. This bond is the result of a system of innate behavioral patterns, selected in the course of evolution, which originate from an intrinsic primary motivation and are responsible for the activation and control of behavior aimed at seeking and maintaining protective proximity with the caregiving figure. Furthermore, the biologically preprogrammed attachment system has a strong adaptive capacity enabling individuals to modify their behavior as a function of the environmental conditions, again for the purpose of restoring the ideal equilibrium rendered unstable by situations endangering one's survival. The great flexibility characterizing this motivational and behavioral system can lead, for example, in the presence of a mother's behavior different from that predicted genetically, to a failure in the child's activation of the system through the selective exclusion of signals designed to ensure this. Thus, these are probabilistic systems related to information processing (Liotti, 1990). Attachment theory claims that individuals, depending on the type of relationship experienced with their attachment figures, will form *Internal Working Models* which are defined as individuals' representations of the world, of their attachment figures, and of themselves and which are used specifically to organize information (Bowlby, 1973; Main, Kaplan, & Cassidy, 1985). These are not rigid representational systems but

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can be triggered and modulated according to the actual environmental and interpersonal circumstances (Bretherton, 1992). Once created, a working model tends to organize perception and to select the attention so as to become stable and self-perpetuating. These models thus tend to remain stable and to form the individual's personality traits. Hence, significant individual differences exist in the quality of the attachment relationships that reflect the different ways in which children represent their caregivers (Ainsworth, Blehar, Waters, & Wall, 1978). Children with solid attachment bonds tend to represent their caregivers as attentive and helpful, while insecure children see their caregivers as unreliable and inaccessible, thus producing an ambivalent or avoidant attachment relationship.

Quality of Attachment and Processing Information

Considerable research has pointed to the link between the quality of attachment and the different ways in which the individual is able to process information. Bowlby (1980), for example, claims that if during childhood the individual was obliged to forget painful episodes, these prohibitions may operate by completely excluding these events from memory, by preventing a conscious recall of the episodes, or by prohibiting communication between memory systems or models.

Bowlby (1980) has described three styles for processing information according to the respective bonds of attachment to the primary figure. *Secure* individuals quickly perceive the information they need for attachment and have both access to the information stored in memory and the ability to combine emotive and cognitive information during the processing. *Avoidant* individuals defensively exclude from perception much of the significant information relevant to the attachment bond, have reduced access to memories of attachment experiences and, when processing the information, neglect that which refers to the emotional state. *Ambivalent* individuals perceive most of the attachment-related information, have direct access to it, and have no trouble recalling the associated emotional tone. However, the function of evaluating emotional information is not integrated with cognitive information. As a result, ambivalent individuals are unable to distinguish threatening situations from nonthreatening situations and remain on the alert, maintaining a constantly active attachment system.

Avoidant and ambivalent individuals' configurations thus represent configurations both of behavior and of the mental processing of information. Both these configurations are distorted, and have been developed to allow the individuals to adapt to distorted environments even by sacrificing parts of their self. Avoidants do so by foregoing access to affective information; the ambivalents, on the other hand, have only a limited access to the strategies involving cognitive information. Secure individuals have access both to affectively and cognitively generated information and are able to combine these information sources flexibly.

In more recent studies a difference has also been found among the different attachment styles and different methods of information processing. Some research has shown that insecure attachment is characterized by the absence of any consistent metacognitive organization of multiple models (Main, 1991) and that secure, avoidant, and ambivalent attachment styles differed in a diverse set of motivational, cognitive, and emotional regulation phenomena (Reis & Patrick, 1996; Shaver, Collins, & Clark, 1996). Internal Working Models have been considered in terms of metacognitive structures that help the individual to organize and interpret the information through cognitive processes such as selective perception and memory (Bretherton, 1991, Collins & Read, 1994). The results of the research by Green-Hennessy and Reis (1998) have revealed the connection between Internal Working Models of attachment and the complexity of other representations. Results show that avoidant individuals are less receptive to new information than secure individuals and less able to differentiate their representations than secure and ambivalent individuals. Similar results were obtained in Mikulincer's (1997) research in which it was found that secure individuals displayed a greater capacity to seek new information and to integrate it in cognitive structures than did avoidants and ambivalents.

Perception and Cognitive Styles

On the other hand, studies referring to human perception (Erdelyi, 1974; Mandler, 1975; Norman, 1976) have shown that before any individual becomes aware of seeing or hearing something, the flow of stimuli passing through his or her senses has already gone through several stages of selection, interpretation and evaluation that have excluded a good deal of the original flow. This exclusion is due above all to the fact that the channels involved in higher-level processing have a limited capacity and must be protected from overload. The control and selection criteria applied to the sensory flow to de-

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termine what information will be accepted and what excluded in the course of an individual's life are built up in the course of development and reflect that person's main interests, his/her needs, but also the method selected, albeit unconsciously, to resolve any internal or external conflict. In fact, controls, like defense mechanisms, are the way the individual harmonizes his/her needs with the requirements of reality. These controls, through their activation or inhibition mechanisms, thus have adaptive properties.

Hence, the method chosen by the individual for selecting information seems to depend on the cognitive control exerted by each individual, on the way he or she organizes their own knowledge and on the strategies typically used in individuals' perceptive activity, and on their mode of memorizing and of thinking. Cognitive controls become regulatory tendencies or cognitive aptitudes that may account for several differences characterizing the individuals themselves. They operate at a hierarchically higher level than the functions performed by perception, memory, or other mental structures. The result of the interaction among the various cognitive controls goes to make up a characteristic pattern for each subject, which may be defined as cognitive style (Gardner, Jackson, & Messick, 1960). Therefore, cognitive styles may be considered as very broad "dimensions" representing the typical, coherent, and stable functioning modes that individuals display in their perceptual and intellectual behavior and which form an integral part of their personality. These styles may affect the way in which we approach certain problem situations, or how we classify the significant information of any context, what and how we commit to memory; they may be numerous and affect both the cognitive and the emotional sphere. Whenever an individual is faced with any problem situation they will focus on what is perceived as the important aspects of the problem. Each subject will classify the significant information relating to the context, searching through their own internal reference system. Each will end up by finding other previously coded data that are included in a similar category, which will help him to formulate hypotheses as a means to obtaining a solution (Fontana, 1996).

Toward a Theory of the Selection of Information

In the cognitivist approach, therefore, the selection of information or the different way in which it is processed depends on a functional need. Nevertheless, those who study emotional development claim that this selection takes place through the exclusion of those elements that are considered by the individual as nonsignificant or even painful.

The different information processing modes thus refer to both cognitive and affective processes that develop and are formed through constant interaction with the environment (Zajonc, Pietromonaco, & Bargh, 1982). Despite the lively debate that has taken place among researchers, we still do not know whether it is emotional information that guides cognitive information, or vice versa. The most reasonable position is the one according to which the various configurations act to different degrees in different individuals (Crittenden, 1994). It has also been postulated that a mentally healthy person should possess a balance between the emotional and the cognitive and have the capacity to process the information resulting from this integration (Vygotski, 1987). Whenever the cognitive dominates the affective, and vice versa, a psychopathological risk factor is apparently introduced.

Attachment and Field Independence

Our research has been situated within these lines of research for the purpose of verifying whether any relationship exists between the two aspects, cognitive and emotional, in the way information is processed by comparing a particular perceptual mode, field dependence/independence, and different ways of experiencing affective relationship according to the different attachment styles. What led us to examine these two aspects was the belief that both are stratified at a behavioral level very early in the individual's life. It may, therefore, be postulated that, starting in childhood, an individual learns to filter the sensory perceptions from the outside world in a way that is consistent with his or her behavioral attachment style. Moreover, we also know that different studies, carried out to trace the origins of individual personality differences, have indicated the existence, in early family experiences, of a relationship between field-dependence in the child and the quality of its relations with the parents (Dyk & Witkin, 1965; Barclay & Cusumano, 1967; Dawson, 1967). Also, emotions such as shame and guilt, which were found to represent a possible response to experiences of rejection by the attachment figure, proved to be related to perceptual field dependence (Lewis, 1995).

Research carried out so far on the different information processing modes involved in the various attachment styles has shown relationships, above all, to cogni-

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tive processes, such as memory (Fraley, Garner, & Shaver, 2000; Youngblade & Dunn, 1995), attention (Kirsh & Cassidy, 1997; Main et al., 1985), representational and linguistic skills (Main et al., 1985; Ainsworth et al., 1978; Cassidy, 1994), reflective (Dennett, 1987), or problem solving capacities (De Ruiter & van Ijzendoorn, 1993; Moss, Parent, Gosselin, & Dumont, 1993). Experiments carried out during this research showed that secure children display better cognitive performance than their insecure peers. The choice of this type of perceptual capacity was made on the basis of the characteristics that represent the dependent-independent field and that appear to resemble closely the characteristics of the avoidants and ambivalents, as a result of which some causal relationship between them has been hypothesized.

Field-dependent individuals (Witkin, 1965) are those with a perceptual style in which the prevalent overall organization of the field is dominant so that the various parts of the field are experienced as merging with the background. Conversely, field-independent individuals have a more analytical perception and display the ability to isolate and distinguish a simple figure in a context in which the larger structure tends to absorb within itself the smaller one.

Research carried out in order to trace the possible relationships between field-dependence and other personality traits has revealed a set of similarities that allows the detection of a perceptual and behavioral style that apparently characterizes individuals lying at the two poles of this dimension.

Investigation of the global/analytical cognitive style, which is a direct consequence of the dependence/independence field, must, however, be viewed as a continuous interaction between the individual and the environment which, as a result of their reciprocal influence, realizes the best adaptive mode to suit the demands of the environment (Witkin, 1950). Furthermore, the two perceptual modalities lie at the two extremes of a continuum. On the one hand, field-independent individuals are more autonomous and less impressionable, but also have a strong sense of identity that is often not integrated with the real context; on the other hand, field-dependent individuals are more attentive and sensitive to others, but also display a lower resistance to "group pressures" (Witkin & Goodenough, 1977). As Witkin pointed out, no positive or negative value judgments may be made about these two perceptual modalities, as both can be good or bad depending on the function or task to be fulfilled, and only excessive leaning in one direction or the other can give rise to pathological behavioral forms.

Purpose

The main aim of the present research was thus to verify the existence of a relationship between attachment and field dependence/independence in terms of individual differences in information processing.

In particular, we have postulated that, as has been found for other cognitive skills widely described in the literature, individuals with ambivalent attachment, since they are constantly preoccupied with maintaining an active control over the environment, develop a greater ability to identify details, in this case concerning the hidden figure. On the contrary, we have hypothesized that individuals with avoidant style attachment, having learned to adapt to the environment by excluding parts of the information (in particular, the part referring to emotions), experience greater difficulty in identifying the details and have a greater tendency toward a more global perception. Secure individuals, on the other hand, are deemed to occupy an intermediate position, achieving task execution time close to the sample average. Moreover, we would expect, as was shown in previous studies (Witkin, Price, Bestini, Cristiansen, Oltman, Ramirez, & Van Meel 1974; Huteau 1987), that males tend toward a more field-independent style than females and this observed difference can exert an influence also on the way affective relations are experienced.

Method

Subjects

The research involved 380 subjects, 160 males and 220 females, aged between 17 and 59 years of age (mean age 22.64 *SD* = 6.9), homogeneous for educational level.

All subjects had at least an upper middle school certificate. Most of them were undergraduate students. None of them displayed retarded cognitive, social, linguistic, or affective development that would in any way distort the results of the proposed test.

The Experience in Close Relationships (ECR) test was administered to measure the attachment bond in couple relations, while a subsample of 122 subjects, (mean age 25.98 *SD* = 5.59), randomly selected, was also given the Embedded Figures Test (EFT) to measure field dependence-independence. The use of an adult sample stemmed from the decision to investigate two already structured personality traits no longer subject to change, as instead would be the case during both cognitive and emotional development.

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Procedure

Materials

Attachment in couple relations

Attachment style was evaluated by using the Experience in Close Relationships questionnaire (ECR) of Brennan et al. (1998), which has been validated also in Italy (Picardi, Vermigli, Toni, D'Amico, Bitetti, & Pasquini, 2002).

This questionnaire comprises two 18-item subscales scored on a seven-point Likert scale (ranging from completely false to completely true). One subscale measures the *avoidance* (Cronbach's $\alpha = 0.89$), the other the *anxiety* dimension (Cronbach's $\alpha = 0.89$). Avoidance is linked to difficulties and discomfort involved in approaching and emotionally trusting the partner while anxiety indicates an intense preoccupation over sentimental relations, and fear of being abandoned accompanied by frequent demands for the affection and involvement of the partner.

The scoring procedure simply consists of summing the scores of the various items comprising each subscale, taking into account the fact that the score of some items is reverse coded.

The mean Anxiety and Avoidance scores of our sample are shown in Table 1. Four groups were identified: secure, ambivalent, avoidant, and disorganized. Each subject's attachment style was determined with reference to Bartholomew's conceptual model (Bartholomew & Horowitz, 1991):

- *Avoidant subjects* are those for whom the mean "anxiety" score is lower than the mean plus one standard deviation of the sample; conversely, on the "avoidance" scale, they obtain scores exceeding the mean plus one standard deviation;
- *Ambivalent subjects* are those for whom the mean "avoidance" scale score is lower than the mean plus one standard deviation of the sample; conversely, on the "anxiety" scale, they obtain scores exceeding the mean plus one standard deviation;
- *Secure subjects* are those who have means on the two scales that are lower than the mean plus one standard deviation of the sample;
- *Disorganized subjects* are those who, both on the "anxiety" and the "avoidance" scale, obtain scores in excess of the mean plus one standard deviation.

Table 1
Means and standard deviation of anxiety and avoidance ($N = 380$).

"ECR" Variables	Mean	*SD*	Total (*M* + *SD*)
Anxiety	62.71	15.04	77.75
Avoidance	44.46	17.19	61.65

Field Dependence/Independence

The second test used to measure field dependence/independence is the EFT of Witkin, Oltman, Raskin, and Karp (1971); validated in Italy by Fogliani Messina, Fogliani, and Di Nuovo (1984). After administering a trial item to the subject and having ensured the task was understood, the 12 tables were presented in succession. For each task the subject was asked to identify a previously viewed simple figure embedded inside a larger complex figure designed in such as way as to conceal or mask the simple figure to be perceived. The test was carried out individually. Each subject was allowed 15 s to observe the complex figure, then 10 s to observe the simple figure in the absence of the complex one, and lastly a maximum of three minutes to identify the simple figure (no longer visible) inside the complex one.

For each figure presented the time taken by the subject to identify the hidden figure was recorded. The test result was computed by summing the time required in each single performance; unresolved items were assigned the maximum time (180 s).

The time taken to administer the EFT test was about 30–40 minutes, and for the ECR questionnaire from 15 to 25 minutes.

Statistics

Using Pearson correlation matrices we verified the possibility of a relation between the two tests administered—ECR and EFT.

The *t*-test (for independent samples) was used to evaluate gender-related differences related to (1) subjects' age, (2) EFT test execution time, (3) ECR questionnaire scores related to the factors *anxiety* and *avoidance*. χ^2 analysis was used to evaluate differences in male and female distribution in the attachment groups. Lastly, MANOVA multivariate analysis was used—sex (women vs men) × attachment groups (secure vs avoidant vs ambivalent)—to measure the differences between the results obtained in the EFT test with respect to the attach-

ment groups. Finally, the Duncan test made it possible to detect any significant between-group differences.

Results

EFT Test Performance Time

Since a large body of research (see discussion) indicates different EFT test execution time for males and females, it was deemed important to ascertain whether this was true also for our sample. The results obtained using the *t*-test revealed gender-related differences in the time taken by our sample in executing the Embedded Figures Test (EFT). As shown in Table 2, women usually took longer to perform the test than men and a significant difference between the two groups was found.

Table 2
Means and standard deviation of EFT test performance time of males and females relative to *t*-test (*N* = 122).

Gender	Subjects	Variable Time Mean	*SD*	*T*-value	DF	*p*
Males	54	40.89	20.20	3.036	120	.003*
Females	68	52.04	20.13			

*$p < .05$

Attachment and Measurement of Individual Characteristics

For the second test, ECR, the four attachment groups were formed on the basis of Bartholomew's conceptual scheme (see Procedure). The sample was distributed over the four groups in accordance with the percentages shown in Table 3. The data were also subjected to the χ^2 statistical test in order to detect any differences in male and female frequencies within the four attachment groups. No significant differences emerged from this analysis.

Frequency distribution over the various groups was characterized by a low number of cells referring to disorganized subjects, who were thus excluded from the analysis.

Separate measurement was also made of gender incidence with regard to the scores obtained by subjects in the two ECR subscales *anxiety* and *avoidance*.

Table 4 shows the mean scores, respectively, for *anxiety* and *avoidance* concerning males and females and the significant differences emerging from a comparison between them.

As can be seen, in our sample, women score significantly higher than men regarding the factor *anxiety.* No significant differences emerge as far as the factor *avoidance* is concerned.

Relationship Between Attachment Types and Field Dependence-Independence

We set out to check whether a relationship existed between the two dimensions Anxiety and Avoidance and

Table 3
Frequency of attachment groups for males and females (*N* = 122).

Gender	Ambivalent		Secure		Disorganized		Avoidant		Total	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%
Female	14	21	43	63	4	6	7	10	68	100.0
Male	4	7	43	80	1	2	6	11	54	100.0

Table 4
Means and *SD* of anxiety and avoidance in males and females and relative *t*-test (*N* = 122).

"ECR" Variables	Males		Females		*T*-Value	DF	*p*
	X	*SD*	*X*	*SD*			
Anxiety	57.94	15.6	66	17.52	2.65	120	.0092*
Avoidance	42.0	14.37	44.35	21.15	.70	120	.49

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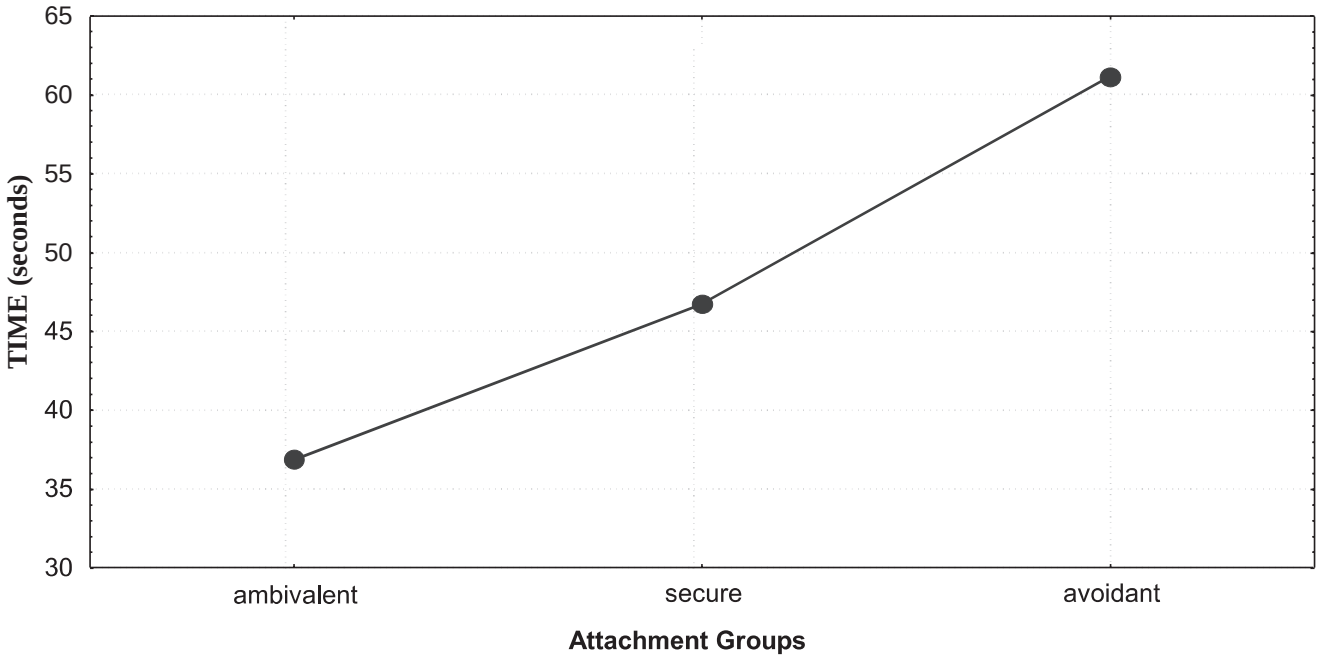

Figure 1
Mean execution time of the EFT test in the three attachment groups.

Table 5
MANOVA: Gender × Attachment groups with respect to EFT test performance time.

		DF	M^2	F	p
Gender	Effect	1	117.08	.35	.55
	Error	111	333.66		
Groups	Effect	2	1930.39	5.79	.04*
	Error	111	333.66		
Gender/	Effect	2	1244.06*	3.73	.027*
GroupsError	111	333.66*			

*$p < 0.05$

Table 6
MANOVA: EFT performance time × attachment groups.

Attachment groups	{1} EFT means 46.74	{2} EFT means 61.17	{3} EFT means 36.89
Secure {1}		.012*	.085
Avoidant {2}	.012*		.0001*
Ambivalent {3}	.085	.0001*	

EFT test performance time. The correlation matrices showed that the subjects with high scores on the "avoidance" scale took longer to perform the EFT test ($r = .18$, $p < .05$). No significant relation was found between scores achieved on the Anxiety scale and the task performance time ($r = –.06$, $p < .94$). At this stage, we decided to check for differences in EFT test performance time by comparing the various attachment groups.

In view of the significant gender-related differences found in the *t*-test referring to field dependence/independence, it was deemed of interest to take into account the differences in EFT test performance time using MANOVA analysis of variance: gender (women vs men) × attachment groups (secure vs avoidant vs ambivalent) (Table 5). As already mentioned, the small number of disorganized subjects was not taken into consideration.

As can be seen in Table 5, the attachment groups were found to be associated, with a significant effect, with the EFT test performance time. The variable *gender* alone does not emerge as significant but displays an effect on task execution time when associated with attachment groups.

Post hoc analysis (using the Duncan test) showed that, in EFT test performance, avoidants took significantly longer than ambivalent and secure subjects (Table

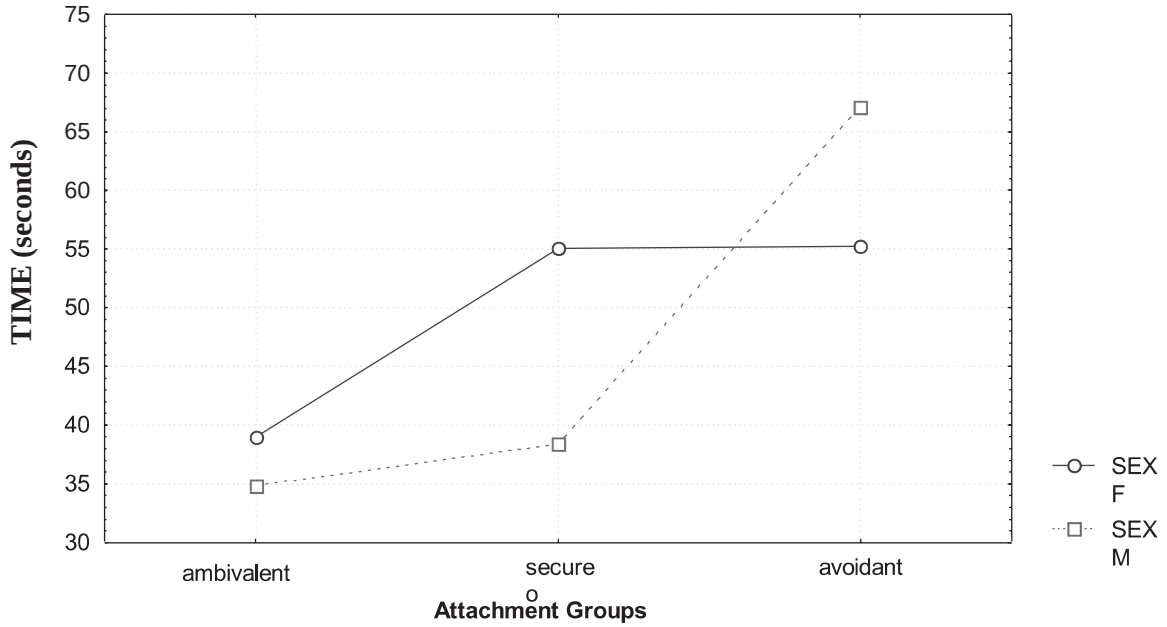

Figure 2
Mean EFT performance time by gender and attachment.

Table 7
MANOVA: Sex × Attachment groups against EFT performance time.

		Duncan Test					
Gender	Attachment Groups	{1} EFT means 55.05	{2} EFT means 55.24	{3} EFT means 38.96	{4} EFT means 38.44	{5} EFT means 67.1	{6} EFT means 34.81
F	secure {1}		.98	.067	.07	.19	.033*
F	avoidant {2}	.98		.079	.079	.17	.036*
F	ambivalent {3}	.067	.079		.95	.003*	.66
M	secure {4}	.07	.079	.95		.003*	.68
M	avoidant {5}	.19	.17	.003*	.003*		.001*
M	ambivalent{6}	.033*	.036*	.66	.68	.001*	

6). In their turn, the ambivalent were situated on the opposite pole compared with the avoidants, taking even a shorter time than the secure subjects.

Figure 1 shows the general trend of the group effect on EFT performance.

Within the female group, no attachment group related differences were found, whereas in the case of the male group, avoidant men differed significantly from both secure and ambivalent individuals (Table 7). Moreover, on comparing males with females, the greater differences were found to refer to ambivalent women vs secure males, and secure and avoidant women vs ambivalent men.

Comparison of the means showed that the significant differences observed among attachment groups were due mainly to the men's contribution (Figure 2).

Discussion

First of all the main aim of the present work was to draw attention to two constructs: attachment and field dependence/independence, both of which are fundamental to the study of individual differences in information processing.

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Attachment, which has proved to be of pivotal importance in the interpretation of individual behavior and is based on an analysis of early relations in children during their first years of life, currently represents an important topic of scientific interest and social significance in the study of the development of cognitive processes is concerned. Moreover, field dependence/independence represents one of the most significant stylistic dimensions utilized by the individual to make strategic choices in his or her cognitive performance. It was deemed of great interest to examine the relations among these quite separate, although complementary, aspects of the personality.

Significant intergroup differences were found concerning attachment styles; in particular, avoidants take appreciably longer in EFT test performance than ambivalents.

The interesting result is that this seems to confirm our initial hypothesis regarding the existence of different information processing modes in individuals characterized by the different ways they experience their affective relations. Figure 2 clearly shows the opposite trends of the two groups (avoidants and ambivalents), while secure individuals seem to occupy an intermediate position between the two.

There seems to be a degree of consistency between the EFT test results and the different attachment configurations associated with them.

Just as Crittenden (1994) found two different information processing modes in avoidants and ambivalents by tracing two types of error back to them, in our results it clearly emerges that avoidants and ambivalents perceive the information from the two opposite poles of the field dependence-independence dimension.

According to Crittenden, the first error type is based on the failure to use or recognize important information; the second is related to the inability to differentiate between important information and irrelevant or distorted information.

Moreover, the first type of error results from the exclusion of important information from perception, affective information in particular, which leads to the construction of models of reality based on partial information; this is believed to be typical of avoidant subjects and leaves them vulnerable to environmental influences. They are, thus, considered to end up interpreting reality not on the basis of what they themselves feel and experience but according to what others want them to perceive. Relations with others are interpreted incorrectly and these individuals are unable to develop empathy for themselves or for others.

The results obtained for the avoidants in our sample show that they experience greater difficulty in discerning a figure hidden in a larger context, which is compatible with the characteristics typical of this group. Their need to be accepted leads them to adapt to the demands of their environment, and the defenses they erect prevent them from having direct access to the information, which is mediated by their interaction with others. Also research carried out by Dyk (1969) on field dependence-independence and the characteristics of mother-child interaction indicated, for example, that field-dependent children, during their infancy, had relations based on very rare and inadequate physical contact with their mother.

The second type of error described by Crittenden is committed by individuals that are highly dependent on access to the attachment figures, which does not allow them to distance themselves from them and to develop skills and self-confidence. As we have seen, this leads to them being constantly activated, exercising control, and highly attentive in order to detect any sign that confirms their state of alert. They cannot distinguish between indicators of actual danger and ordinary events. These individuals are characterized by having an ambivalent attachment style.

In our sample, ambivalent individuals are found to display a strong tendency toward field independence, which leads them to place strong emphasis on every detail, to the detriment of a global cognitive view of information. This is consistent with the results reported by Crittenden (1994) concerning ambivalent subjects' difficulty in distinguishing between important and irrelevant information.

Lastly, secure individuals, midway between the other two configurations, actually seem to be those who manage more successfully (as Witkin claims) to integrate perception with experience. Also Fogliani, Messina, Fogliani, and Caruso (1982) report that individuals with average scores in the EFT performance test, who in our study correspond to secure individuals, are those who obtain near normal scores in the Rorschach test.

Our hypotheses are confirmed by the results obtained from a comparison between male and female EFT test performances which revealed a significant difference between the two sexes (Table 2). This is in line with other reports in the literature (Witkin et al., 1974; Huteau, 1987 and Fogliani et al., 1984). Females take longer than males to perform the test and are, thus, more field dependent, with a significant difference between the two groups. However, field dependence studies have not always shown these differences, nor have they

supported the neurobiological explanation of some characteristics of field dependent subjects. Some researchers (Witkin & Goodenough, 1981) have accounted for them by a lower degree of hemispheric lateralization in female subjects who, on average, are more field dependent than males. Other studies have instead confuted these positions by indicating that the greater dependence displayed by women, when it is present, may be due more to environmental factors than to inadequate basic capabilities (Balestrieri & Busch-Rossnagel, 1989). Also, research on cognitive styles in general has found in the literature a series of interpretations of gender-related differences ranging from cultural and educational models (Francescato, 1976; Laosa, 1980) to different visuospatial abilities (Sherman, 1967; Brown, 1983; Fogliani Messina et al. 1984), to a different hemispheric specialization or to a different intrahemispheric organization of the right hemisphere (Cruciani & Berenbaum, 1998). On the other hand, more recent studies indicate that it is necessary to abandon the nevertheless attractive hypothesis that field dependence is linked to the functioning of one hemisphere, and instead to postulate a more complex relationship with brain hemispheric asymmetry (Russo, Persegani, Papeschi, Nicolini, & Trimarchi, 2000). However, Sherman (1967) and Vaught (1965) claim that gender-related differences in field dependence are entirely the result of cultural norms as, from their early infancy, boys are requested to be more active and independent and girls to be more tractable and amenable. The research carried out so far seems increasingly to support an interrelationship between individual (biological, neuropsychological and personological) factors and sociocultural factors (attachment patterns, learning, socialization models). However, no truly multidisciplinary studies have yet been carried out that are capable of simultaneously linking together such a wide variety of research fields and of producing integrated, scientifically valid, results.

Gender-related differences also emerged when we compared male and female scores in the two dimensions of attachment: anxiety and avoidance. Women scored significantly higher than men in the first scale. In the second, although obtaining higher average scores, women did not differ significantly from males. Also, the results of Bartholomew and Horowitz' (1991) two studies, carried out to validate a new model envisaging four attachment styles in adults, indicated significant gender-related differences similar to those found in our sample. In both the first and the second study, females actually scored higher than males in the "preoccupied" profile, while males scored higher in the "dismissing" category only in the first study. These results differ from those obtained by Hazan and Shaver (1987) who found no gender-related differences in their sample.

When evaluating the results using MANOVA multivariate analysis, it was observed that the principal effect of the differences in the EFT response time was due to attachment styles, although an interesting gender/attachment interaction also emerged that enhances the information framework by bringing to light an opposite trend in males and females in the various groups.

While secure females closely approach the reaction time of avoidant females, in males exactly the opposite happens, that is, the response time of secure individuals approaches that of ambivalents, unlike avoidants who take the longest time of all groups. In other words, while the ambivalents' behavior is understandable, as literature reports show that these persons are characterized by the tendency to pay considerable attention to change owing to their need to closely control everything surrounding them (Crittenden, 1994), it is more difficult to understand the behavior of secure males who seem to have times quite comparable to those of ambivalents. Furthermore, the results of interaction further enrich the evidence regarding the gender difference obtained using the *t*-test.

While it is true that men, as a group, generally show shorter response times than the women's group, this faster speed is actually due solely to the contribution of ambivalents and secure individuals. On the other hand, if the focus is shifted to the avoidant group, it is observed that men score higher even than women.

Overall, the results seem to indicate that, at the level of individual differences, attachment styles have a stronger effect on the cognitive performance investigated as a function of gender. Furthermore, also from Mikulincer's (1997) studies, individuals with different attachment styles displayed different ways of processing information and results did not change when gender was introduced as a covariate. In particular, a study was made of the capacity to seek new information and the capacity to incorporate it into cognitive structures.

Secure individuals display greater curiosity for and more actively seek new information and show greater mental openness and cognitive flexibility, which afford them a higher tolerance to ambiguity and a refusal to endorse rigid beliefs.

Insecure individuals seemed to prefer stable knowledge and displayed high levels of cognitive closure. Differences nevertheless emerged between avoidants and ambivalents. The former displayed greater curiosity about new information than ambivalents and consid-

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ered being curious as a way to make new contacts even if the fear of hurting others' feelings meant that they used the new information to avoid social contact. On the other hand, ambivalents displayed a conflicted attitude, considering curiosity as an opportunity to gain control over the environment and, thus, wishing to explore it. At the same time, however, they expressed fears over what they might discover even to the extent of displaying cognitive closure over the new information. There seem to be analogies between these results and those of our study. Secure individuals, whose response times are close to the average values, could be likened to those showing curiosity over the solution of the task, and therefore an openness to new information, as well as the capacity to take the entire context into account without being overly influenced by the task to be performed. Insecure individuals are found at the two extremes, with the avoidants displaying an excessive cognitive closure regarding the new information, to the extent of failing to perceive it and to include it in a broader context, and the ambivalents focusing unduly on details and failing to see the totality of the context.

Conclusion

These results, although not all pointing in the same direction, nevertheless show up the significant role played by the variable *gender* in EFT test performance time and in attachment dimensions. Indeed, the Multivariate Analysis results indicate a predominant influence by attachment groups vis-à-vis gender-related effects on task performance time, but at the same time also a non-negligible effect of the variable *gender*, which again becomes significant when it is interacting with the attachment groups.

Although the present study has only an exploratory function, it may be considered to have provided interesting indications that must be further pursued. So far, attachment, and in particular the "avoidant" dimension, has actually been found to be associated with the strategies deployed to organize cognitive representation and that are aimed at limiting access to the information concerning attachment, particularly those involving emotions. The effect of attachment on cognitive processes seems to be due to the quantity and quality of the stimuli received in the relationship with the caregiving figure. As a matter of fact, the secure child explores the environment more, obtaining a much larger quantity of information and stimuli than insecure children. This accounts for the greater linguistic, representational, relational, and problem-solving capacities of secure children compared with their insecure peers. The results of the present research, as well as confirming the differences in the ways that the members of different attachment style categories process information, can also foster a further and super-examination of the cognitive strategies underpinning the way information is processed. Although not affecting attachment directly, these strategies nevertheless seem to be closely linked to it in such a way as to be configured as adaptive choices made by the individual that ultimately characterize his or her cognitive style.

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